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PHOTOGRAPHIC INTERPRETATION REPORT

DEEP-SPACE PROBE TRACKING AND COMMUNICATION CENTER, YEVPATORIYA, USSR

CIA DIA

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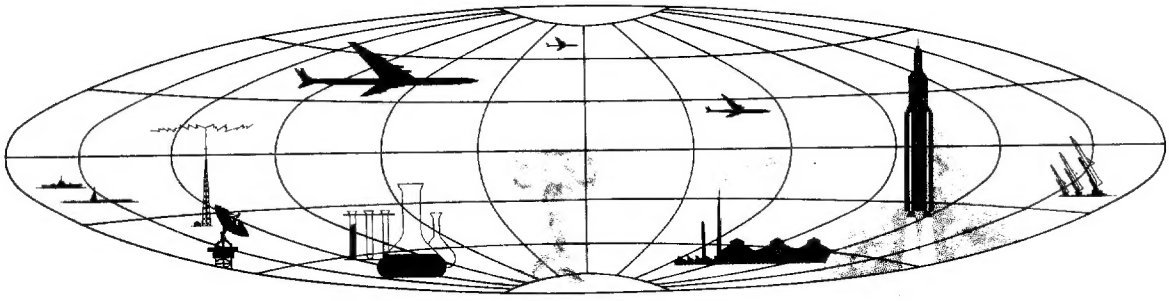
NATIONAL PHOTOGRAPHIC INTERPRETATION CENTER



DEEP-SPACE PROBE TRACKING AND COMMUNICATION CENTER, YEVPATORIYA, USSR

INTRODUCTION

The Soviet Deep-Space Probe Tracking and Communication Center is located on the Crimean Peninsula just west of Yevpatoriya (Figure 1). The center consists of two tracking stations, designated North and South, and a microwave station.

The Soviets have published a newspaper series describing the center's facilities and operations, and a general description of the center has been reported by Sir Bernard Lovell (see Appendix).

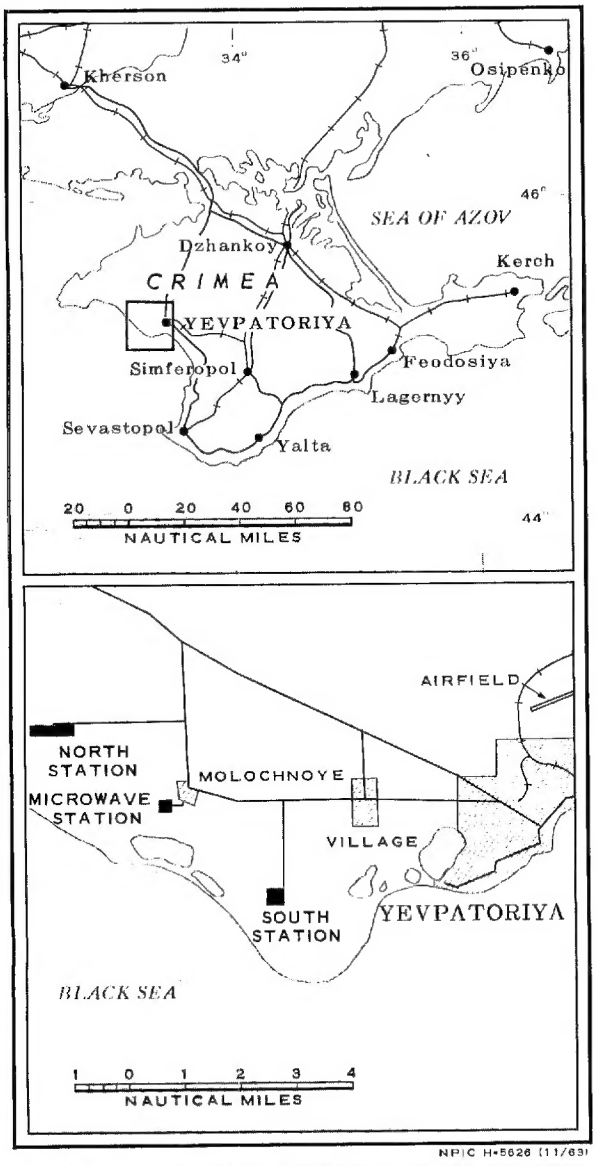


FIGURE 1. LOCATION OF DEEP-SPACE PROBE TRACKING AND COMMUNICATION CENTER.

NORTH STATION

This part of the center is located at 45-13-15N 33-09-30E, 9 nautical miles (nm) west-northwest of Yevpatoriya (Figure 1). The station is divided by security fences into three sections: a celestial communication section, a support section, and a probable terrestrial communication section.

Celestial Communication Section

This section (Figure 2, item A) contains 2 steerable antenna arrays located 1,970 feet (600 meters) apart, 2 possible amplifier buildings (item A1) each measuring 200 by 60 feet, and 9 miscellaneous control and/or laboratory buildings ranging from 225 by 50 feet to 50 by 20 feet. Each steerable antenna array (Figure 3) consists of eight 16-meter solid, circular parabolic reflectors arranged in two rows of four reflectors each. The reflectors are closely spaced on a heavy framework that measures 250 by 125 feet overall. The array is supported (cantilever principle) by a circular pier approximately 150 feet in diameter. The overall height of the array and pier is approximately 100 feet. Feed masts are visible in each reflector. An

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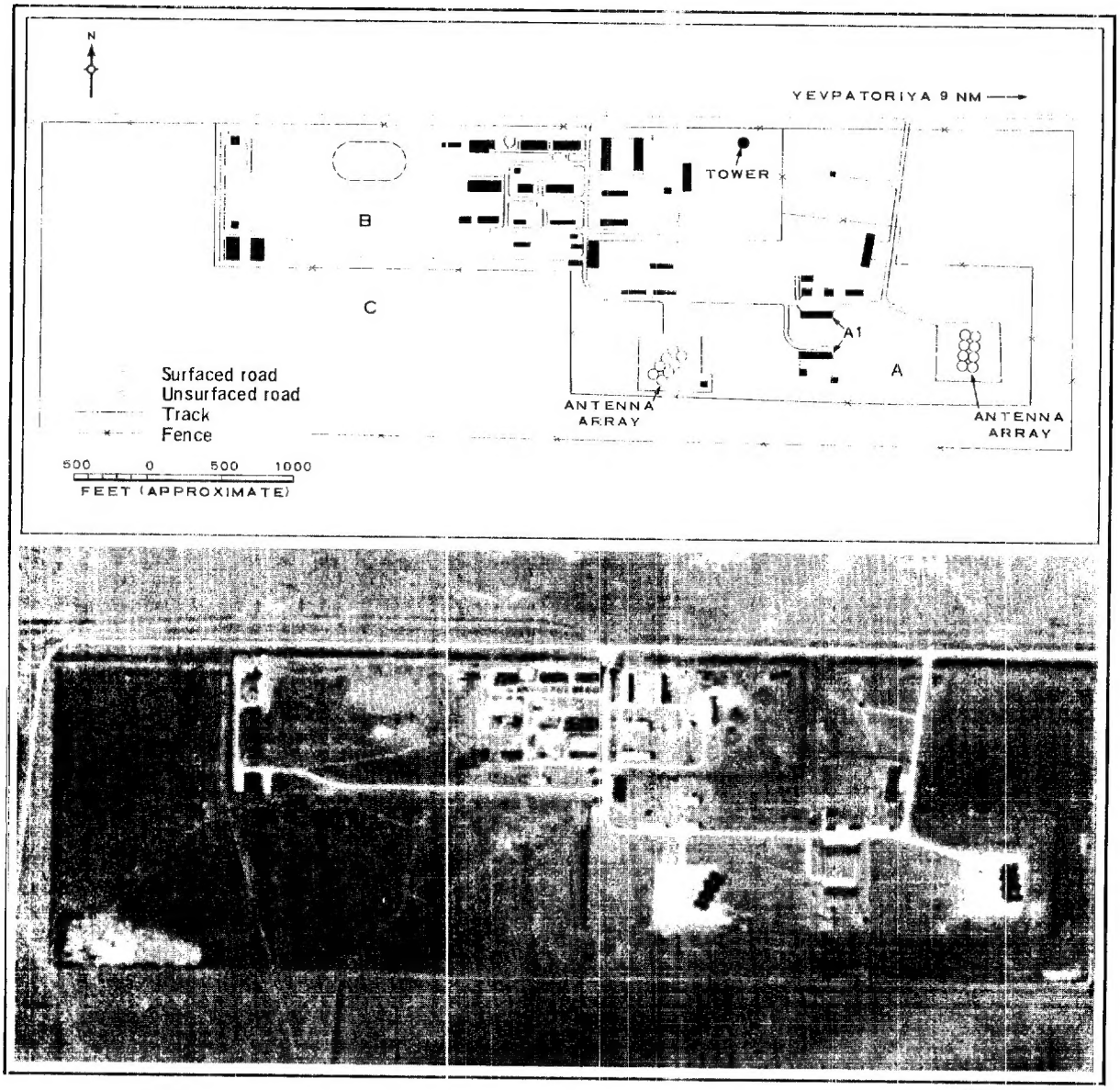

FIGURE 2. NORTH STATION, YEVPATORIYA DEEP-SPACE PROBE TRACKING AND COMMUNICATION CENTER, [redacted] 25X1D

optimum steering capability is indicated by the varying horizontal and vertical bearings that have been noted in repeated photographic observation of the arrays since [redacted] 25X1D The dual function of the arrays is believed to be a)tracking, and b)receiving telemetry/communications from deep-space probes ("automatic interplanetary stations").

Support Section

This section (item B) contains 27 structures utilized for support functions such as

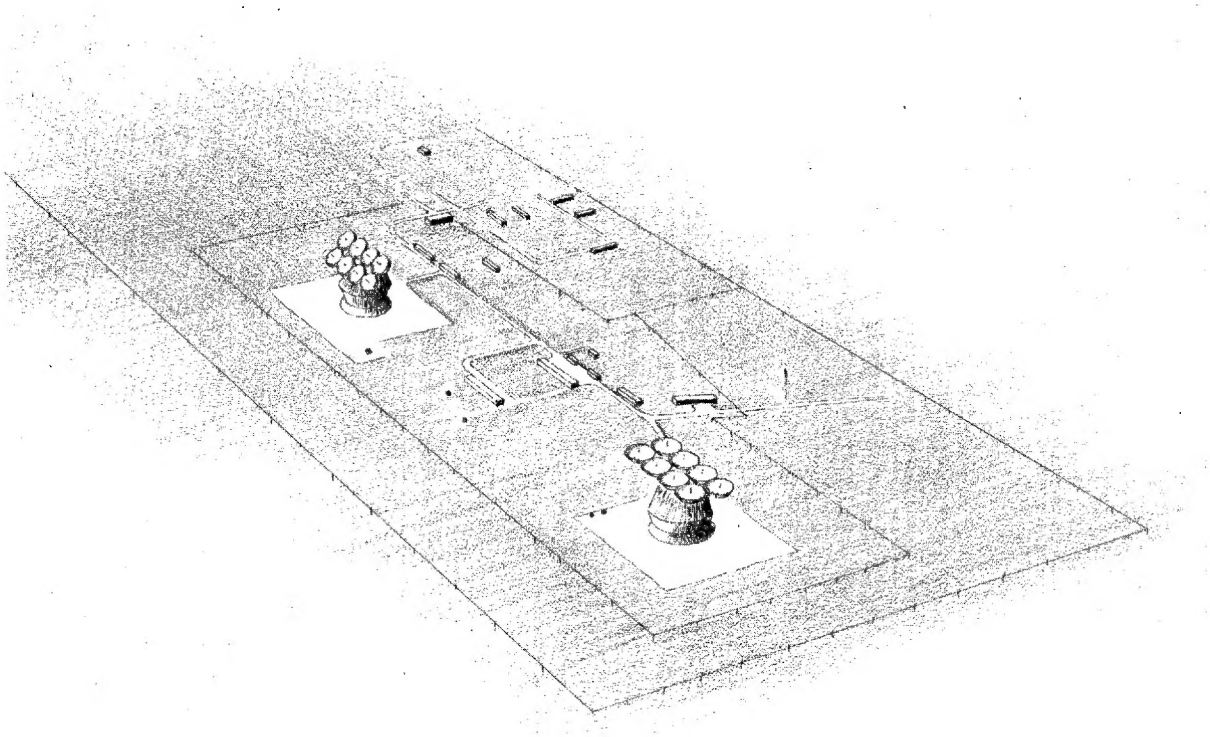

FIGURE 3. PERSPECTIVE DRAWING OF ANTENNA ARRAYS AT NORTH STATION. [redacted] 25X1

housing, administration, maintenance, and storage. Quarters for 200-300 personnel are provided by four barracks-type buildings, each 150 by 45 feet.

Probable Terrestrial Communication Section

This section (item C) consists of approximately 109 acres of grassland. The general appearance of the section suggests that high-frequency receiving antennas may be present, but the type or number cannot be determined.

SOUTH STATION

This part of the center is located at 45-10-20N 33-15-30E, 4.5 nm west-southwest of Yevpatoriya (Figure 1). The station is divided by security fences, and consists of four main sections: a celestial communication section, a support section, a probable terrestrial communication section, and a possible antenna array section.

Celestial Communication Section

This section (Figure 4, item A) consists of a steerable antenna array which is identical, or nearly so, to the arrays at North Station; a semiburied control building 200 by 60 feet (item A1); and approximately four miscellaneous structures. The array is believed to be the transmitter for communication with deep-space probes.

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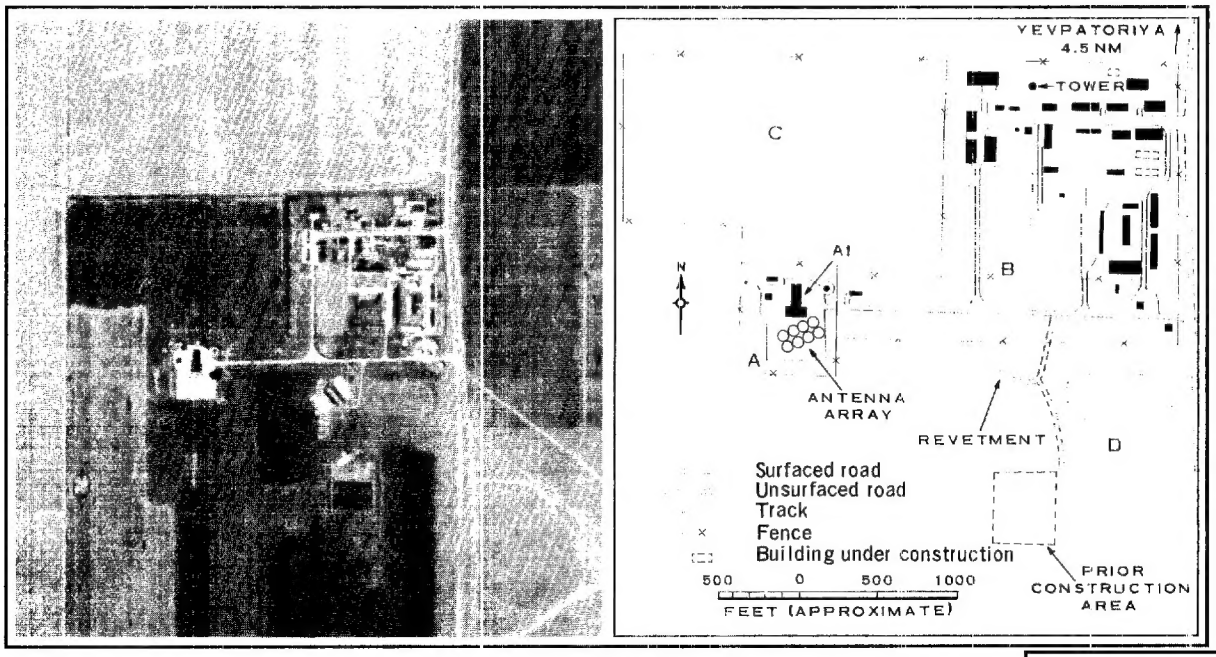

FIGURE 4. SOUTH STATION, YEVPATORIYA DEEP-SPACE PROBE TRACKING AND COMMUNICATION CENTER, [redacted] 25X1

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Support Section

This section (item B) contains 30 support structures for functions such as housing, administration, maintenance, and storage. Quarters for 200-300 personnel are provided by four barracks-type buildings, each 150 by 45 feet.

Probable Terrestrial Communication Section

This section (item C) consists of approximately 58 acres of grassland. The general appearance of the section suggests that high-frequency transmitting antennas may be present, but the type or number cannot be determined.

25X1C [redacted]

Possible Antenna Array Section

This section (item D) appeared inactive in [redacted] and has remained in an inactive status since. Traces of a prior construction area suggest that a large antenna array may have been planned for this section. A U-shaped revetment is located 700 feet north of the prior construction area, but no present function can be ascertained for it. An athletics area is located just east of the revetment.

25X1D

MICROWAVE STATION

The station is located midway between North and South Stations at 45-11-45N 33-13-10E, 6 nm west of Yevpatoriya (Figure 1). It is road-served from the village of Molochnoye.

The station consists of a control building and a lattice tower approximately 240 feet high that supports two microwave dishes. The dishes appear to be oriented in the general direction of Simferopol. A wire line connects this station to North Station.

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APPENDIX: COLLATERAL MATERIAL ON THE YEVPATORIYA AREA

Excerpts from a Russian Newspaper Series

"...There are three antennas in all at the space center... Quite a bit of time is needed to climb to the top of the antenna. Its highest point is about on a level with a 12 story building! ...Eight large mirrors, each of them 16 meters in diameter, form the working part of the antenna... An energy collector is located in the center of the antenna...weight is more than 1,000 tons...the transmitters have a power of more than 100 kilowatts... operating on frequencies of 922.76 mc/s and 183.6 mc/s... The tracking station for long-range radio communications goes into operation only when six hours have elapsed after the launching... The duration of each contact with the automatic interplanetary station is an hour and a half...information includes trajectory data and scientific information reports..." 3/

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Excerpt from an Article by Sir Bernard Lovell

"By far the most remarkable radio observatory in the Soviet Union is, however, the deep-space tracking station in the Crimea. There I saw aerials and electronic equipment provided with a lavishness that one does not find elsewhere in the Soviet Union. I estimated that the equipment was worth about 20 million pounds sterling by British standards, and, what was just as remarkable, the whole thing was evidently built in a year, in 1960. As few Russians have been able to visit the place, I felt very privileged at being the first Westerner to go there.

"The primary purpose of the station, and the reason for its existence, is the tracking of lunar and planetary probes; it was from here that the abortive Venus and Mars probes were commanded. It belongs to the Institute of Radiotechnics and Electronics, directed by Academician V.A. Kotelnikov.

"There are three identical aerial systems spaced out over ten kilometers; one is a transmitter and the others are receivers. Each consists of eight 16-meter fully-steerable dishes arranged in two rows of four, providing the equivalent of a 150-foot aerial. There is comprehensive equipment for working at 920 mc/s (32-cm wavelength) and at other frequencies. The receiving equipment is superb, making use of cooled parametric amplifiers and masers, the like of which we shall not have on the Jodrell Bank radio telescope until the end of this year." 4/

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REFERENCES

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MAPS OR CHARTS

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3. Dept. of Commerce. JPRS 61,523 (tr of Komsomol'skaya Pravda, 2,3,4 Nov 62, V. Gubarev, "Attention! The Automatic Interplanetary Station is Calling...") (UNCLASSIFIED)

4. Lovell, Sir Bernard. "Soviet Aims in Astronomy and Space Research," New Scientist, No 349, 25 Jul 63, pp 174-175 (UNCLASSIFIED)

REQUIREMENT

NSA. NSA/P056/R94-62

NPIC PROJECT

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